

## DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

### RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750)

#### Migration of Contaminated Groundwater Under Control

Facility Name: Equilon Enterprises LLC—Puget Sound Refining Company  
Facility Address: P.O. Box 622, 8505 S. Texas Road, Anacortes, WA 98221  
Facility EPA ID #: WAD009276197

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

  X   If yes - check here and continue with #2 below.

       If no - re-evaluate existing data, or

       If data are not available, skip to #8 and enter "IN" (more information needed) status code.

#### **BACKGROUND**

##### **Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

##### **Definition of "Migration of Contaminated Groundwater Under Control" EI**

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

##### **Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains **ONLY** to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

##### **Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database **ONLY** as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**

Page 2

2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

☒ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

☐ If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

☐ If unknown - skip to #8 and enter “IN” status code.

Location	Constituent	Appropriate Protective Level (ug/l) (MTCA)
SWMU 1	Benzene	5
SWMU 11	Benzene	5
	Ethylbenzene	30
	Xylene	20
	1,2-Dichloroethane	5
Land Treatment Farm (LTF)	Benzene	5
MTCA 10	TPH	1000
Hydrotreater #2	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
Blending Plant	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
	TPH	1000

#### References

- Workplan for the RCRA Facility Investigation of Solid Waste Management Units at the Texaco Puget Sound Plant, Prepared by K.W. Brown & Associates, Inc., November 1990

#### *References for SWMU 1*

- Phase I Investigation of Oily Water Sewer (SWMU 1) Release at Manhole #6-E, K.W. Brown Environmental Services, August 1991
- SWMU 1 RFI Workplan Amendment, K.W. Brown Environmental Services, August 1991
- RFI Report for SWMU 1—Oily Water Sewer, K.W. Brown Environmental Services, January 1992
- Workplan for the Phase II RCRA Facility Investigation of SWMU 1—Oily Water Sewer, K.W. Brown Environmental Services, July 1992
- Letter from Texaco requesting use of camera survey in lieu of Phase II workplan, September 1994

#### *References for MTCA 10*

- Reconnaissance Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- RFI Report for SWMUs 10 and 11, K.W. Brown & Associates, Inc., April 1991
- Hydrocarbon Source Delineation in the Vicinity of RCRA SWMU 10, K.W. Brown & Associates,

- Inc., September 1992
- Summary of SWMU 10 Investigations—Texaco Puget Sound Plant, Remediation Technologies, Inc., June 1995
- Status Report on the Independent Cleanup of Hydrocarbons in the Vicinity of the Intermediate Impounding Basin (MTCA 10), submitted to Ecology semiannually, September 1993 to present

#### *References for SWMU 11*

- Reconnaissance Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- Sludge/Sediment Removal and Soil Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- RFI Report for SWMUs 10 and 11, K.W. Brown & Associates, Inc., April 1991
- RFI Workplan Amendment and Project Update—SWMU 11, K.W. Brown & Associates, Inc., June 1991
- SWMU 11 Pump Test, K.W. Brown & Associates, Inc., October 1991
- Workplan for Conducting SWMU 11 Phase II RFI Activities, Texaco Puget Sound Plant, Anacortes, Washington, K.W. Brown & Associates, Inc., April 1992
- Interim Groundwater Monitoring and Sampling Report—SWMU 11, submitted to Ecology semiannually, July 1992 to present

#### *Land Treatment Farms*

- Final Class 3 Permit Modification Request, ThermoRetec Consulting Corporation, May 2000
- Part B Permit Renewal, ThermoRetec Consulting Corporation, May 1999

#### *References for Hydrotreater #2*

- Groundwater Assessment Report for the Hydrotreating Unit No. 2, Texaco Refining and Marketing Inc., April 1994

#### *References for Blending Plant*

- Surface Soil Assessment in the Vicinity of the Blending Plant, Texaco Refining and Marketing Inc., May 1993

#### *References for Areas of No Further Action*

- Workplan for the RCRA Facility Investigation of Solid Waste Management Units at the Texaco Puget Sound Plant, Attachment 1 Environmental Assessment—Alkylation Units 1 and 2, Prepared by K.W. Brown & Associates, Inc., November 1990
- RFI Report for SWMU 31, March 1991
- Letter from EPA confirming that no further investigative or remedial activities need to be undertaken for SWMU 31, June 25, 1991
- RFI Report for SWMU 30, July 1991
- RFI Report for SWMUs 40 and 46, K.W. Brown & Associates, Inc., July 1991
- Closure Plan for Interim Status Surface Impoundments at the Texaco Puget Sound Plant, Effluent Treatment Plant, K.W. Brown & Associates, Inc., December 1992
- Consent Decree for Flare Landfarm, August 1993
- Final Closure Report for the South Overflow Basin, Remediation Technologies, Inc., April 1994
- Final Closure Report for the North Overflow Basin, Remediation Technologies, Inc., November 1994
- Final Closure Report for the Equalization Basin, Remediation Technologies, Inc., December 1994
- Final Closure Report for the Surge Basin, Remediation Technologies, Inc., December 1994
- EPA letter dated April 7, 1997 stating that no further action is required for SWMUs 8, 9, 10, 30 and 31.

#### Footnotes:

<sup>1</sup>“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**

Page 3

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

- \_\_\_\_\_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”<sup>2</sup>).
- \_\_\_\_\_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.
- \_\_\_X\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

*SWMU 1*

- Due to the generally low permeability of the soils at the site, PSRC doesn’t anticipate significant migration of any potential contaminant from SWMU 1, the oily water sewer (OWS). The decision not to further investigate the OWS, was made jointly with EPA and WDOE (Paul Skyllingstad and Kim Wigfield). The OWS investigation was not a priority because there was little possibility that the contamination would migrate offsite (due to soil conditions), and it was also a national issue with no resolution, i.e., there was no method to identify the extent of the contamination and whether or not the sewers were the source. PSRC has attended meetings with Ecology and EPA to discuss remediation issues, and the OWS has never been identified as a priority.

*SWMU 11*

- No constituents of concern above the appropriately protective risk-based levels have been found in the perimeter wells, and it is anticipated that any migration from the site that was originally impacted would be detected by monitoring the wells.

*Land Treatment Farm (LTF)*

- No constituents of concern above the appropriately protective risk-based levels have been found in the perimeter wells, and it is anticipated that any migration from the East or West Land Treatment Farm would be detected by monitoring the wells.

*MTCA 10*

- No constituents of concern above the appropriately protective risk-based levels have been found in the perimeter wells, and it is anticipated that any migration from the site that was originally impacted would be detected by monitoring the wells.

*Hydrotreater #2*

- No constituents of concern above the appropriately protective risk-based levels have been found in the perimeter wells, and it is anticipated that any migration from the site that was originally impacted would be detected by monitoring the wells.

*Blending Plant*

- Per Texaco's submittal to Ecology dated September 1993, an impermeable liner was installed capping the site. The intent of the liner was to mitigate potential human exposure to the site and eliminate water infiltration from immediately above the location of the contaminated site. Due to the generally low permeability of soils in the area and the mitigation of the impervious cap, PSRC believes that there is little likelihood of significant migration of residual contamination from the originally impacted site. The letter notifying Ecology of the installation of the mitigation was dated July 5, 1995.

<sup>2</sup> "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

Page 4

4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

\_\_\_\_\_ If yes - continue after identifying potentially affected surface water bodies.

**X** If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Site observations and groundwater monitoring data at the site do not indicate any evidence of discharges to surface water bodies.

**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**

Page 5

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

\_\_\_\_\_ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

\_\_\_\_\_ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

<sup>3</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**  
Page 6

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>4</sup>)?

\_\_\_\_\_ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,<sup>5</sup> appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

<sup>4</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>5</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.



**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**

Page 7

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

\_\_\_\_\_ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

\_\_\_\_\_ If no - enter “NO” status code in #8.

**X** If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

*SWMU 1*

- Due to the generally low permeability of the soils at the site, PSRC doesn’t anticipate significant migration of any potential contaminant from SWMU 1, the oily water sewer (OWS). The decision not to further investigate the OWS, was made jointly with EPA and WDOE (Paul Skillingstad and Kim Wigfield). The OWS investigation was not a priority because there was little possibility that the contamination would migrate offsite (due to soil conditions), and it was also a national issue with no resolution, i.e., there was no method to identify the extent of the contamination and whether or not the sewers were the source. PSRC has attended meetings with Ecology and EPA to discuss remediation issues, and the OWS has never been identified as a priority.

*SWMU 11*

- SWMU 11 has a system of compliance monitoring wells, and the wells are sampled twice during the year.

*Land Treatment Farm (LTF)*

- The Land Treatment Farm has a system of compliance monitoring wells. The wells that are down gradient from the West Land Treatment Farm are monitored twice during the year. The East Land Farm is in closure, and waste is no longer being applied to the East Land Treatment Farm. The wells down gradient of the East Land Treatment Farm are monitored at 1, 2, 4, 8 and 12 years

*MTCA 10*

- MTCA 10 has a system of compliance monitoring wells, and the wells are sampled twice during the year.

*Hydrotreater #2*

- Hydrotreater #2 has a system of compliance monitoring wells, and the wells are sampled once during the year.

*Blending Plant*

- Per Texaco’s submittal to Ecology dated September 1993, an impermeable liner was installed capping the site. The intent of the liner was to mitigate potential human exposure to the site, and eliminate water infiltration from immediately above the location of the contaminated site. Due to the generally low permeability of soils in the area and the mitigation of the impervious cap, PSRC believes that there is little likelihood of significant migration of residual contamination from the originally impacted site. The letter notifying Ecology of the installation of the mitigation was dated July 5, 1995.

## Page 8

- YE - Yes, “Migration of Contaminated Groundwater Under Control” has been verified. Based on a review of the information contained in this EI determination, it has been determined that the “Migration of Contaminated Groundwater” is “Under Control” at the **Equilon Enterprises LLC—Puget Sound Refining Company** facility, EPA ID # **WAD009276197**, located in **Anacortes, Washington**. Specifically, this determination indicates that the migration of “contaminated” groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the “existing area of contaminated groundwater” This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.
- NO - Unacceptable migration of contaminated groundwater is observed or expected.
- X   IN - More information is needed to make a determination.

Supervisor (signature) \_\_\_\_\_ Date 4/18/01  
(print) Carol Kraege \_\_\_\_\_  
(title) Industrial Section Manager \_\_\_\_\_  
 Ecology SWFAP-Industrial Section

**Washington State Department of Ecology, Industrial Section  
(360) 407-6916  
300 Desmond Drive  
Lacey, Washington 98503**

(name) Nancy Kmet  
(phone #) (360) 407-6941  
(e-mail) nkme461@ecy.wa.gov